CALIFORNIA DEPARTMENT OF HEALTH SERVICES
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

September 2003

Technical Report No. 03-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of September 2003. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

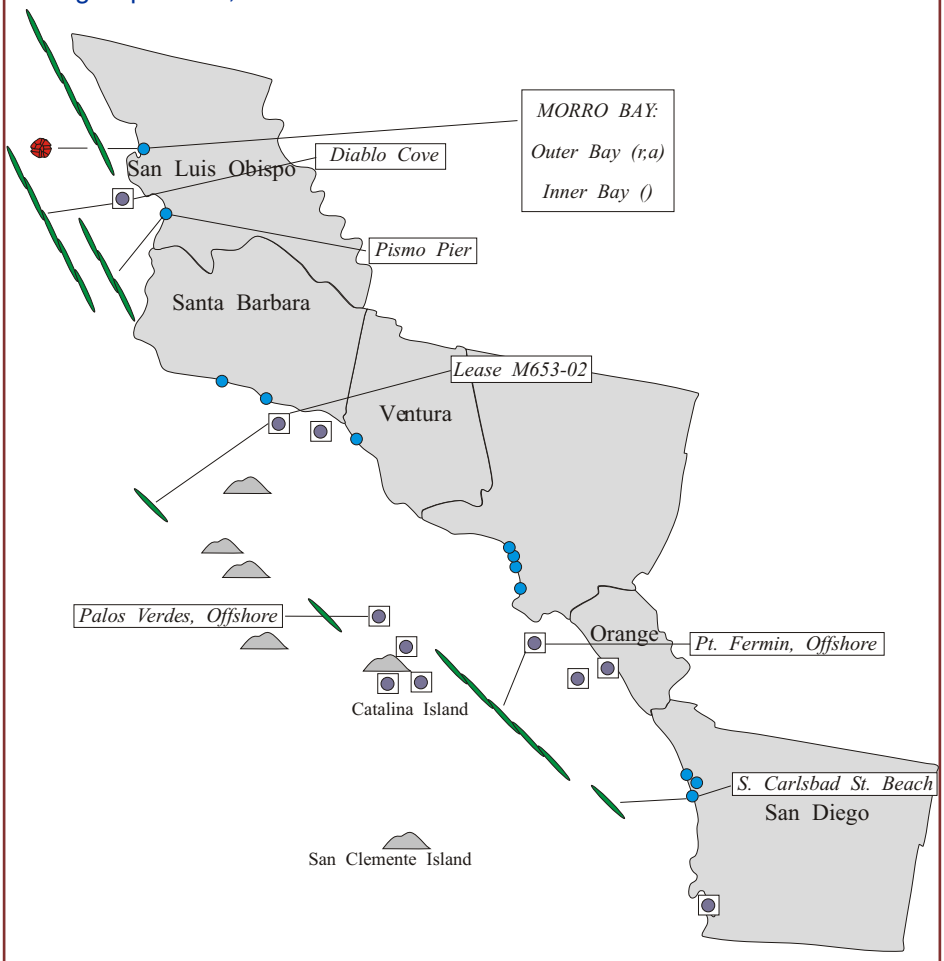
Southern California Summary:

Paralytic Shellfish Poisoning:

Low numbers of *Alexandrium* were observed at one Southern California site during September (Figure 1). On September 12 a

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during September, 2003.



Relative Abundance of Known Toxin Producers

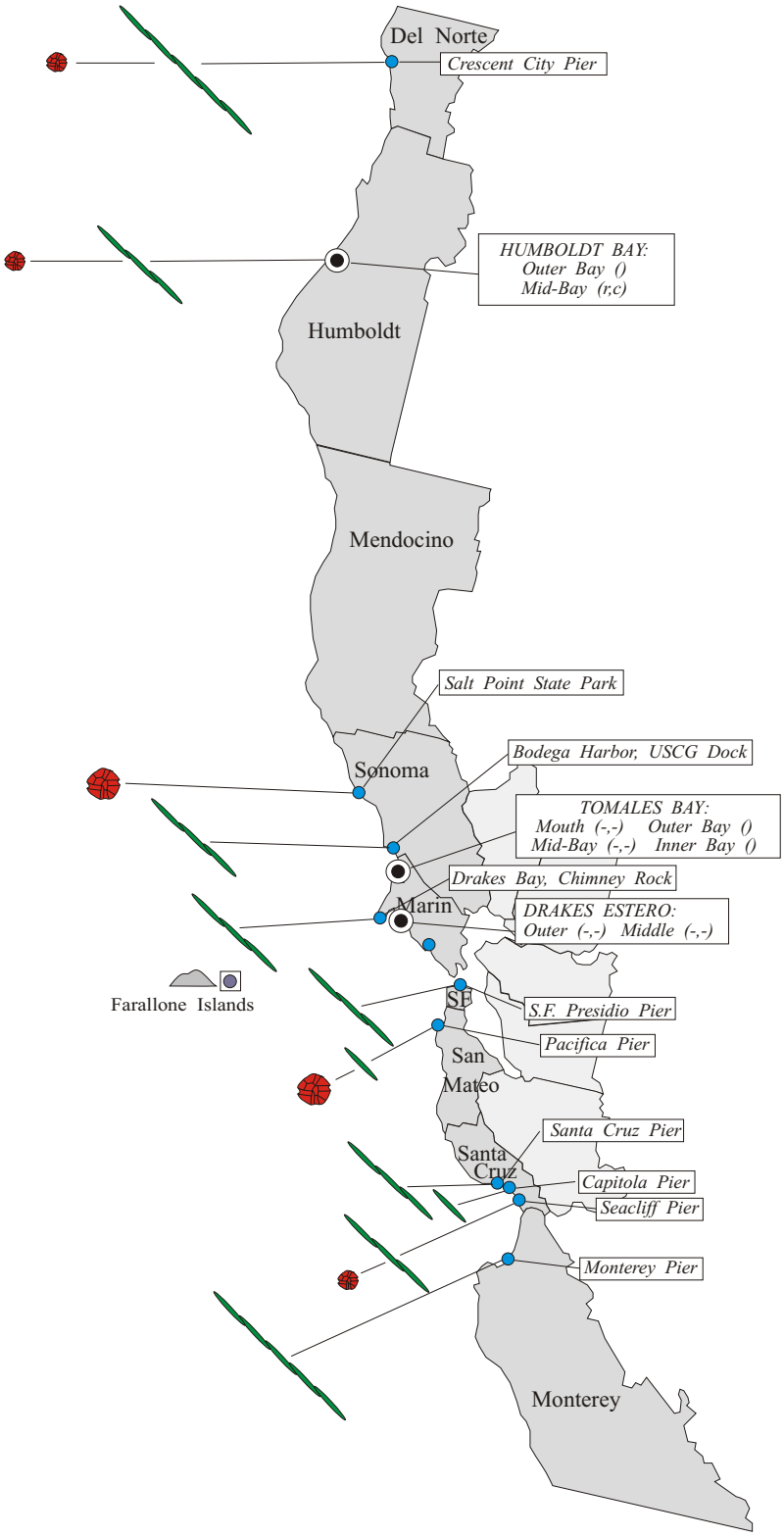
Alexandrium Species	Pseudo-nitzschia Species
Rare (less than 1%)	Present (less than 10%)
Present (between 1% and 10%)	Common (between 10% and 50%)
Common (between 10% and 50%)	Abundant (greater than 50%)
Abundant (greater than 50%)	

For areas with multiple sampling stations, species abundance at each station is represented as follows:
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during September, 2003.



(Continued from Page 1)

small number of this dinoflagellate species were observed inside Morro Bay (San Luis Obispo County) in a sample collected by volunteers from the Morro Bay National Estuary Program. PSP toxicity was not detected in any shellfish samples collected from Morro Bay, or from any other Southern California locations, during September.

Domoic Acid:

The distribution and relative abundance of *Pseudo-nitzschia* increased in September along the Southern California coast compared to August's observations (Figure 1). High relative abundances of this toxin producing diatom continued to be observed along the San Luis Obispo coast at sites inside Morro Bay and offshore of Diablo Cove, with cell mass increasing significantly at the latter site by the first week of September. Domoic acid was not detected in shellfish samples from Southern California locations during September (Figure 3). It should be noted that shellfish were not available at the offshore sites exhibiting the highest numbers of *Pseudo-nitzschia*.

Nontoxic Events:

Of the various nontoxic phytoplankton present in September, dinoflagellates

(Continued on Page 3)

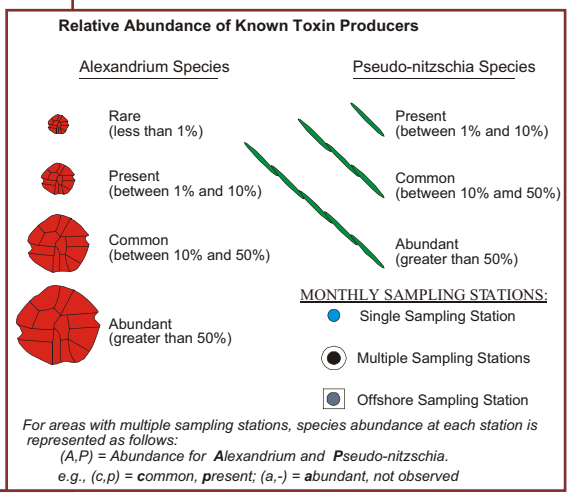
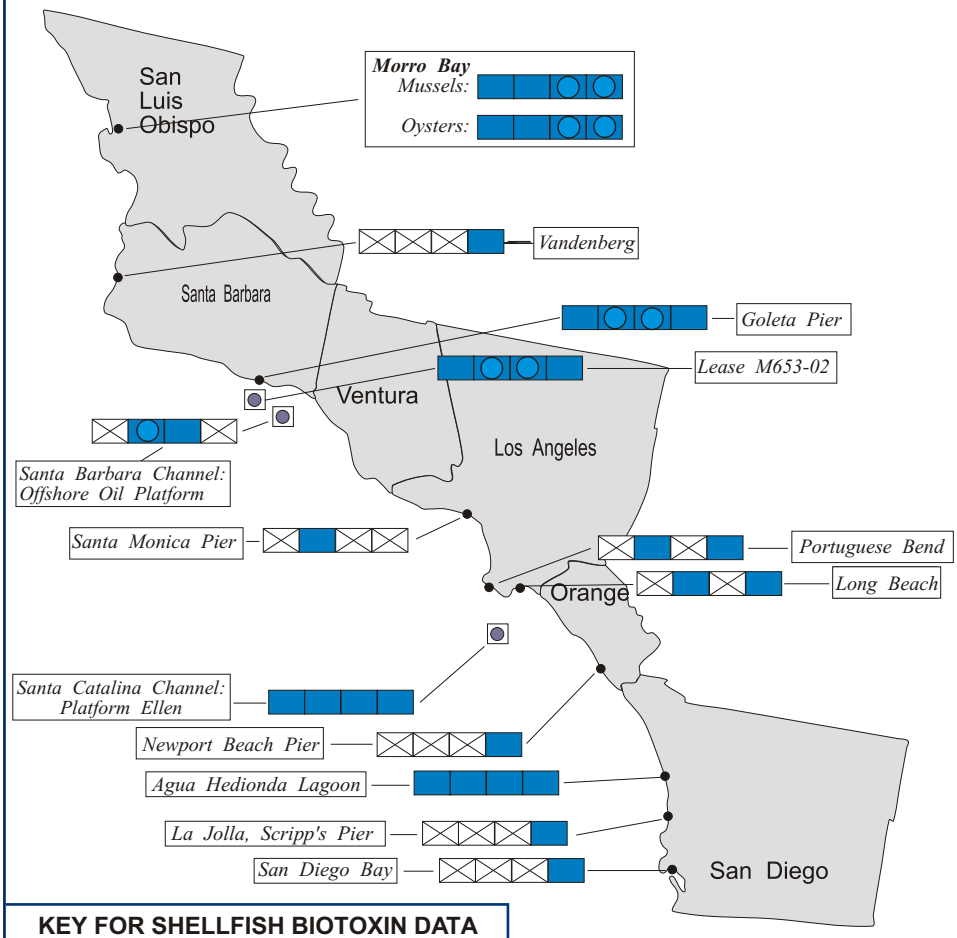


Figure 3. Distribution of shellfish biotoxins in Southern California during September, 2003.



(Continued from Page 2)

continued to dominate the assemblage along the Southern California coast. This group increased in numbers along the San Luis Obispo coast as *Pseudo-nitzschia* declined in the latter half of the month. *Ceratium*, *Protoperidinium, and Lingolodinium polyedrum* were common along the San Luis Obispo coast by September 15. The latter species became dominant by the end of the month along the coast of San Luis Obispo (70% relative abundance), Santa Barbara, and Ventura (99%) counties. *L. polyedrum* had become the dominant organism from Los Angeles to San Diego in late August and continued to bloom throughout September in thisregion.

Northern California Summary:

Paralytic Shellfish Poisoning:

The range of *Alexandrium* continued to span all of Northern California in September (Figure 2). Low relative abundances of this dinoflagellate were detected at several locations between Del Norte and Monterey counties. The highest relative abundance of *Alexandrium* was observed along the Sonoma coast at Salt Point State Park

(Continued on Page 4)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

(Continued from Page 3)

and at the Pacifica Pier in San Mateo County.

Low concentrations of PSP toxins persisted in Humboldt Bay throughout September (Figure 4), continuing a pattern that first began in July. Low levels of these toxins were also detected farther north at Little River State Park (Humboldt County) and at Point St. George (Del Norte County) on September 10. Farther south, along the Mendocino coast, the elevated level of PSP toxins detected in August increased ten-fold to 1600 ug (Fort Bragg, September 29). PSP toxicity also increased above the federal alert level along the Sonoma coast. Mussels from Salt Point State Park contained 46 ug of toxins on September 22 and increased to 108 ug by September 29.

Domoic Acid:

Pseudo-nitzschia was present along the entire Northern California coastline during September (Figure 2). The relative abundance and distribution of this diatom remained approximately the same in most locations but declined along the Marin coast. *Pseudo-nitzschia* remained abundant at the Monterey commercial pier inside Monterey Bay and was common at sites along the Santa Cruz shoreline inside the bay.

Low levels of domoic acid were detected in mussels from the Santa Cruz Pier (2.8 ppm) and Natural Bridges State Park (1.4 ppm) in Santa Cruz County on September 10 (Figure 4). The Department's Food and Drug Branch obtained samples of sardines fished from Monterey Bay, which were found to contain domoic acid at concentrations above the federal alert

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during September, 2003.

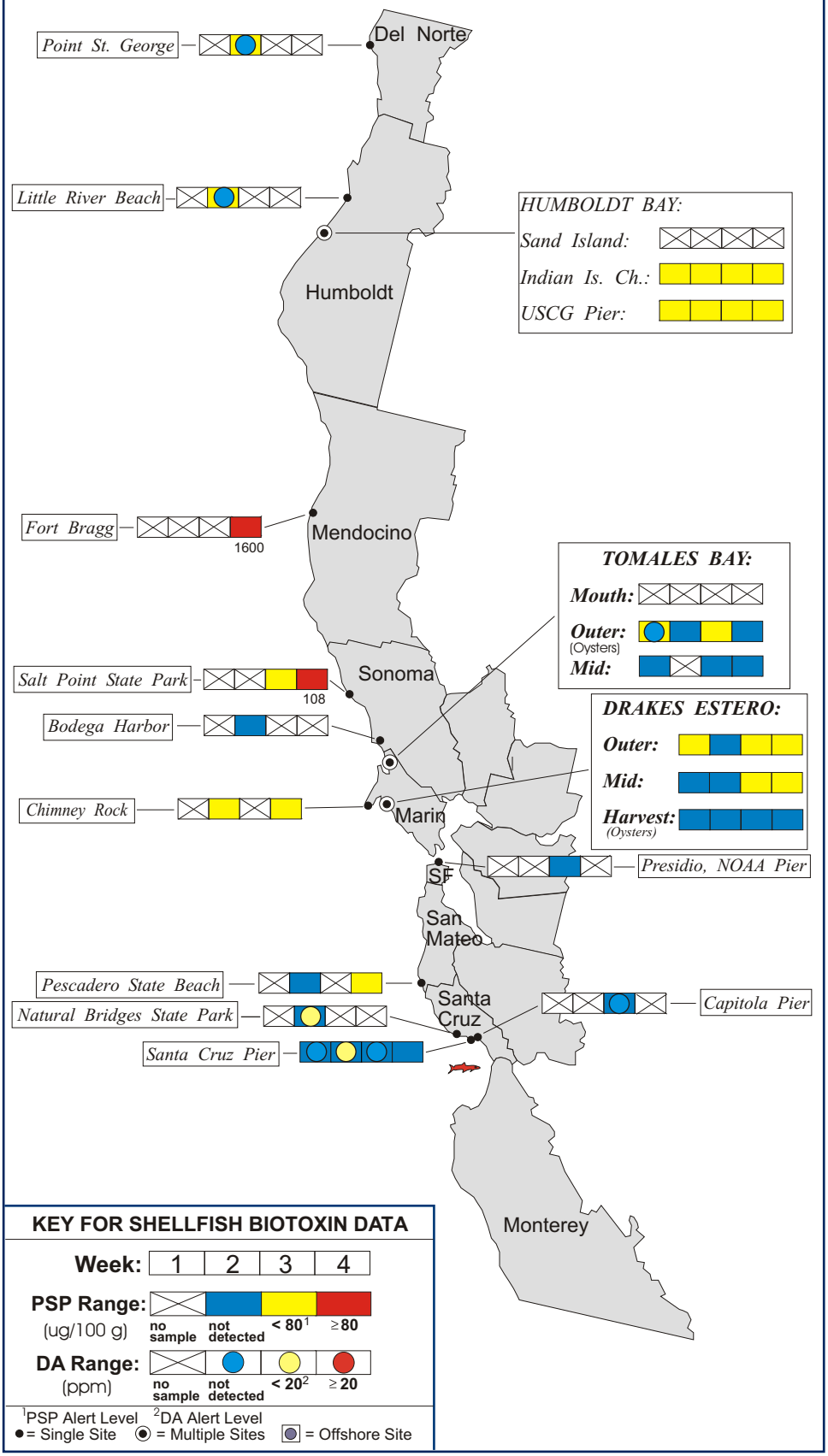


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during September, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	10
	Humboldt County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	Sonoma County Environmental Health Department	1
	CDHS Marine Biotoxin Program	2
Marin	Cove Mussel Company	4
	Hog Island Oyster Company	5
	Johnson Oyster Company	24
	Marin Oyster Company	2
	CDHS Marine Biotoxin Program	2
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	2
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	10
Santa Barbara	U.C. Santa Barbara Marine Science Institute	8
	Santa Barbara Mariculture Company	4
	Vandenberg AFB Environmental Health Services	1
Ventura	None Submitted	
Los Angeles	Los Angeles County Health Department	3
	Aquarium of the Pacific Long Beach	4
Orange	Ecomar, Inc.	5
	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	5
	Scripps Institute for Oceanography	1
	U.S. Navy	1

(Continued from Page 4)

level of 20 ppm. As a result the Department issued a Health Advisory on September 22 (see "Quarantines" below).

Nontoxic Events:

Diatoms continued to dominate the phytoplankton assemblage in Northern California throughout September. *Chaetoceros, Rhizosolenia*, *Ditylum*, and *Coscinodiscus* were the most common species observed.

QUARANTINES:

The Department issued a Health Advisory on September 22 warning consumers not to eat sport-harvested species of sardines, anchovies, the viscera of crab (commonly called "crab butter"), and bivalve shellfish from Monterey and Santa Cruz counties bordering Monterey Bay. This action was taken because of the elevated levels of domoic acid detected in sardines from this area.

The annual quarantine on the sport-harvesting of mussels went into effect on May 1st and will continue through October 31st. This annual quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. This quarantine does not affect the commercial shellfish growing areas in California. All commercial shellfish growers certified by the State of California are required to submit routine samples for biotoxin analysis, allowing us to closely monitor for the occurrence of any toxin.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e.,

(Continued on Page 6)

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during September, 2003.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	CDHS Marine Biotoxin Program	2
Marin	CDHS Volunteers (Brent Anderson, Richard Plant)	9
	Johnson Oyster Company	12
	CDHS Marine Biotoxin Program	2
Alameda	None Submitted	
San Francisco	CDHS Volunteer (Eugenia McNaughton)	2
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	Santa Cruz County Environmental Health Department	3
Monterey	CDHS Volunteer (Jerry Norton)	1
San Luis Obispo	CDHS Volunteers (Rene and Auburn Atkins)	4
	Morro Bay National Estuary Program	6
	Tenera Environmental	4
Santa Barbara	U.C. Santa Barbara Marine Science Institute	5
	California Department of Parks and Recreation	1
	Santa Barbara Mariculture Company	4
Ventura	U.C. Santa Barbara Marine Science Institute	1
Los Angeles	Los Angeles County Sanitation District	4
	Catalina Tall Ships Expedition	9
	City of Los Angeles Environmental Monitoring Division	1
	Los Angeles County Health Department	8
	Los Angeles Regional Water Quality Control Board	1
	Aquarium of the Pacific Long Beach	5
Orange	Orange County Sanitation District	6
San Diego	San Diego County Environmental Health Department	4
	CDHS Volunteer (Paul Sims, Randy Dick, Rachel Woodfield)	8

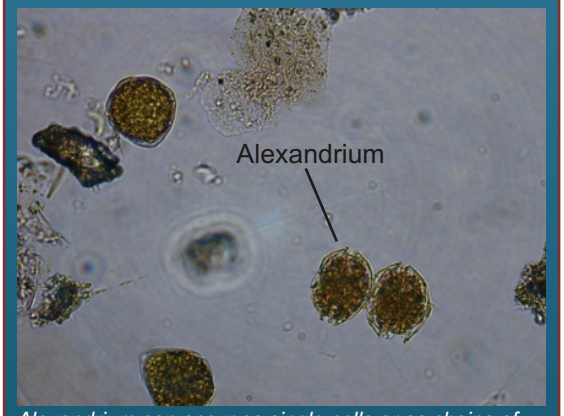
(QUARANTINES, continued from Page 5)

the digestive organs or viscera). Only the white meat of clams and scallops should be prepared for human consumption.

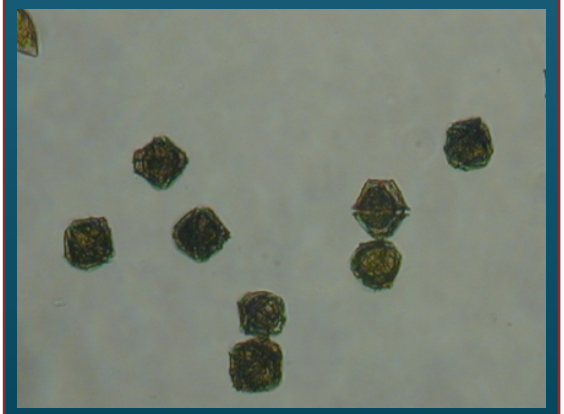
We recommend that persons engaged in the sport-harvesting of any bivalve shellfish (e.g., mussels, clams, scallops) contact the Department's "Shellfish Information Line" at 1-800-553-4133 or (510) 412-4643 for a current update on marine biotoxin activity.

PHYTOPLANKTON GALLERY

Although diatoms were dominant along the Northern California coast in September, the PSP toxin producing dinoflagellate Alexandrium catenella was observed in low numbers at several locations.



Alexandrium can occur as single cells or as chains of two or more cells.



The dinoflagellate Lingulodinium polyedrum was the dominant organism along the Southern California coast, from Santa Barbara through San Diego, in September.